

# IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re Application of

Winterling et al

Serial No. 10/511,107

Filed: April 14, 2003 as a PCT international application

For: INHERENTLY CROSS-LINKABLE POLYAMIDES

## DECLARATION

I, Motonori Yamamoto, a master of sciences, a citizen of Japan and residing at 83, Tannhäusering, 68199 Mannheim, Germany, declare as follows:

I am a fully trained chemist, having studied chemistry at the University of Osaka, Japan, from 1984 to 1991;

I was awarded my master of science degree by the University of Osaka in 1991;

I joined BASF Aktiengesellschaft of 67056 Ludwigshafen, Germany, in 1992 and have since then worked in research and development of polymers.

I am the successor of one of the inventors of the invention, Dr. Winterling, and I am working in the field of the invention disclosed and claimed in Application Serial No. 10/511,107 and therefore I am familiar with the field to which the said application relates.

I have studied the Office Action that has issued in this case and read the references cited therein.

In order to overcome the obviousness rejection vs. Blondel (US-A-4,595,730) the following experiments were carried out under my supervision:

### **Example (according to the instant invention)**

In a laboratory autoclave 45.3 g of caprolactam, 4 g of deionized water and 1.02 g (0.224 mol %) of **5-hexenoic acid** solution (10 % in water) were heated under an atmosphere of nitrogen to an internal temperature of 260 °C, kept under their own pressure for one hour and then decompressed to normal pressure within one hour and post-condensed for 60 minutes.

The polyamide was extracted with boiling water to remove caprolactam and oligomers and then dried in a vacuum drying cabinet. The dried extracted polyamide exhibited a relative solution viscosity (RV) as a 1 weight-% solution in 96 % sulphuric acid according to DIN 51562-1 to 4 of  $2.0 \pm 0.05$ .

The melt volume flow rate (MVR) measurement according to ISO1133 was carried out on the products. The melt temperature for this was 230 °C and the punch weight 2.16 kg.

The table shows the comparison of melt volume flow rates.

Comparative example 1 (according to Blondel (US-A-4,595,730))

The example was repeated with the difference that instead of 5-hexenoic acid, 0.66 g (0.224 mol %) of **propionic acid** solution (10 % in water) was employed. The dried extracted polyamide exhibited a relative solution viscosity (RV) as a 1 weight-% solution in 96 % sulphuric acid according to DIN 51562-1 to 4 of  $2.0 \pm 0.05$ . The post-condensation time was 60 minutes.

Comparative example 2 (according to Blondel (US-A-4,595,730))

The example was repeated with the difference that instead of 5-hexenoic acid, 0.65 g (0.224 mol %) of **acrylic acid** solution (10 % in water) was employed. The dried extracted polyamide exhibited a relative solution viscosity (RV) as a 1 weight-% solution in 96 % sulphuric acid according to DIN 51562-1 to 4 of  $2.0 \pm 0.05$ . The post-condensation time was 45 minutes.

Comparative example 3 (according to Blondel (US-A-4,595,730))

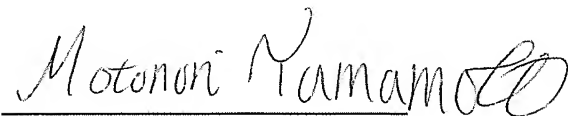
The example was repeated with the difference that instead of 5-hexenoic acid, 1.04 g (0.224 mol %) of **hexanoic acid** solution (10 % in water) was employed. The dried extracted polyamide exhibited a relative solution viscosity (RV) as a 1 weight-% solution in 96 % sulphuric acid according to DIN 51562-1 to 4 of  $2.0 \pm 0.05$ . The post-condensation time was 60 minutes.

	Example	Comparative example 1	Comparative example 2	Comparative example 3
MVR (ml/110 min)	196	181	141	153

The table demonstrates superior results according to application Serial No. 10/511,107 over Blondel (US-A-4,595,730).

I further declare that all statements made herein of my own knowledge are true and that all statements made on information or belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed at 67056 Ludwigshafen, Germany, this 16<sup>th</sup> day of February, 2007.



Signature of Declarant